

AUSTRALASIAN CERATOPOGONIDAE (DIPTERA, NEMATOCERA)
 PART XII: THE STATUS OF THE GENUS *HETEROMYIA* SAY
 IN THE AUSTRALIAN REGION

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(Text Figures 1-8)

[Read 25th June, 1969]

Synopsis

In the literature, four species from the Australian Region have been placed in the genus *Heteromyia* Say. In the present paper, the relationship between these species and the American species of *Heteromyia* is discussed. It is concluded that the Australian species have been incorrectly included in *Heteromyia* and that so far the genus has not been recognized in this region. Three of the species hitherto assigned to this genus are placed in *Palpomyia* Meigen, and the fourth, with an additional new species, is placed in a new genus.

The first species to be described from Australia as a *Heteromyia* was *H. brevibarba* Kieffer, 1917, based on a single female from Brisbane, Queensland. Apparently Kieffer regarded the form of the greatly swollen and spinose fore femur and curved fore tibia as of paramount importance, as *brevibarba* disagrees with the generic diagnosis of *Heteromyia* in several respects. Lee (1948) published a translation of Kieffer's original description, and noted the differences in tarsal and unguinal characters between *Heteromyia* Say and *H. brevibarba*. However, he suggested that *brevibarba* be retained in *Heteromyia* until specimens became available for study and its true generic position could be established. He also described a new species, *Heteromyia tasmanica*, which was similar to *brevibarba* in most characters but lacked the batonnets on the fifth tarsal segments which are a feature of the latter. Tokunaga (1966) added a further two species, *abdominalis* and *pallida*, which are very close to *H. tasmanica*. He noted that all the Australian Region species described had hind claws equally developed in both sexes, unlike *Heteromyia*, and suggested that the unguinal diagnosis for the genus should be corrected to include species with equal claws on all legs, giving the characteristic of this genus as "the apical projection of the fore arcuated tibia beyond the articulation to the tarsus".

The unguinal difference, however, is not the only distinction between the Nearctic-Neotropical species and Australian species which have been assigned to *Heteromyia* by the above authors. These differences are set out below.

Australian species previously assigned to Heteromyia

Nearctic-Neotropical Heteromyia species

- (1) Claws of all legs equal in both sexes.
- (2) Fourth tarsal segment cordate on all legs in both sexes.
- (3) Fifth tarsal segment of fore leg not inflated.
- (4) Hind tarsi not exceptionally long, hind tarsal ratio 2.0 or more.
- (5) Fifth tarsal segments armed with batonnets (only in *brevibarba* Kieffer, 1917).

- Female hind claws long and very unequal.
- Female hind fourth tarsal segment cylindrical, very long.
- Fifth tarsal segment of fore leg inflated.
- Hind legs, especially tarsi, much elongated, hind tarsal ratio about 1.0 or less.
- Fifth tarsal segments unarmed.

Apart from *brevibarba*, the Australian Region species differ from *Palpomyia* only in having an apical projection of variable size on the fore tibia. The degree of swelling and spinosity of the fore femur and the arcuation of the fore tibia are variable within *Palpomyia*, and the Australian species classed as *Heteromyia* represent an extreme development of these features. It is apparent therefore that the affinities of these species are with *Palpomyia* rather than *Heteromyia*, and, with the exception of *brevibarba*, they are not generically distinct from *Palpomyia*. They are therefore transferred as follows:

PALPOMYIA TASMANICA (Lee), comb. nov.

Heteromyia tasmanica Lee, 1948, *Proc. Linn. Soc. N.S.W.*, 73 (1-2): 62-63.

PALPOMYIA ABDOMINALIS (Tokunaga), comb. nov.

Heteromyia abdominalis Tokunaga, 1966, *Pac. Insects*, 8 (1): 106.

PALPOMYIA PALLIDA (Tokunaga), comb. nov.

Heteromyia pallida Tokunaga, 1966, *Pac. Insects*, 8 (1): 107-108.

Amongst previously unidentified material in the School of Public Health and Tropical Medicine collection two specimens were found which proved to be identifiable as Kieffer's *Heteromyia brevibarba*. With the additional information available from the examination of actual specimens it was found that *H. brevibarba* has most of the characters of *Palpomyia* but differs quite markedly in having several pairs of stout batonnets on the fifth tarsal segment of each leg. It also has only a single spermatheca. A further specimen has been examined which is close to *brevibarba* but differs at the specific level. All the above are placed in a new genus, *Mackerrasomyia*.

Genus MACKERRASOMYIA gen. nov.

Heteromyia Say, 1825 sensu Kieffer, 1917, p. 192 (Australian), nec sensu Kieffer, 1917 pp. 325-6 (American) = *Heteromyia* Say, 1825. *Type-species*: *Mackerrasomyia brevibarba* (Kieffer, 1917).

Diagnosis

Female: Eyes bare, widely separated. Antenna with distal five segments elongated, cylindrical. Maxillary palp long, slender, segment III without a large sensory pit, but with sensillae borne on surface. Scutum with a strong anterior tubercle. Fore femur greatly swollen, with numerous short, stout spines, hind femur weakly clubbed distally, mid and hind femora with one or two ventral preapical spines; fore tibia strongly arcuate, with a blunt apical projection, mid and hind tibiae normal; all fourth tarsal segments cordate, fifth tarsal segments armed with several pairs of stout batonnets, the distal pair being separated from the other pairs. Claws paired and equal on all legs, each with a large internal basal tooth. Wing narrow, with conspicuous microtrichia, without macrotrichia; costa extending to $\frac{3}{4}$ of wing length; two radial cells, the second about twice as long as the first; median fork broadly sessile; no intercalary fork; anal vein with a curving fold extending downwards from near its mid-point. Abdomen of female without gland rods; a single spermatheca.

Male: Unknown.

Mackerrasomyia differs from *Palpomyia* in having stout batonnets on the fifth tarsal segment of each leg, and in having only a single spermatheca. It differs from *Heteromyia* in having female claws equal on all legs, all

fourth tarsal segments cordate, fifth tarsal segment of fore leg not inflated, hind legs not elongated, and fifth tarsal segments armed. The genus is named in honour of Dr. I. M. Mackerras, who has made many contributions to the knowledge of Australian Diptera over the past forty years.

Key to the species of Mackerrasomyia

- 1.—All tibiae dark brown *brevibarba* (Kieffer)
 Fore tibia largely yellow, mid and hind tibiae dark brown on
 basal half, yellow on apical half *marginata* n. sp.

The following descriptions are based on specimens mounted in balsam on microscope slides. All measurements are given in millimetres. Wing length is measured from the basal arculus of the wing. Morphological terms used are largely adopted from Wirth, 1952. SPHTM = School of Public Health and Tropical Medicine, Sydney.

MACKERRASOMYIA BREVIBARBA (Kieffer)

Heteromyia brevibarba Kieffer, 1917, *Ann. Mus. Nat. Hung.*, 15: 192.
 (Type locality: Brisbane, Queensland.)

Kieffer's holotype specimen was deposited in the Magyar Nemzeti Muzeum. A letter from this museum (28/11/1963, on file in SPHTM) has provided the information that the Ceratopogonidae were among the collections of that museum consumed by fire in 1956. As the holotype is no longer in existence, the two specimens in the SPHTM collection are designated as neotype and neoparatype respectively.

Types: Neotype ♀ and one ♀ neoparatype, in SPHTM.

Type Locality: Brisbane, Queensland (11.xii.1922, I. M. Mackerras).

Female: Length 3.34 mm., wing 2.38 × 0.84 mm.

Head dark reddish-brown. Proboscis $\frac{1}{2}$ the height of the head. Eyes bare, widely separated. Mandibular teeth 7 large, 2 small. Palp dark brown, segment III not swollen, with a few small, shallow sensory pits and long sensillae on the distal surface (Fig. 1). Palpal ratio 3.0.

<i>Palpal segment</i>	..	I	II	III	IV	V
<i>Length</i>	..	0.038	0.064	0.091	0.064	0.079

Antennal segment II dark brown, segment III yellowish with apical third dark brown, IV–VI dark brown, basal third yellow, VII–X dark brown, bases paler, XI–XIV dark brown with bases slightly paler, elongated, XV missing (Figs 2–3).

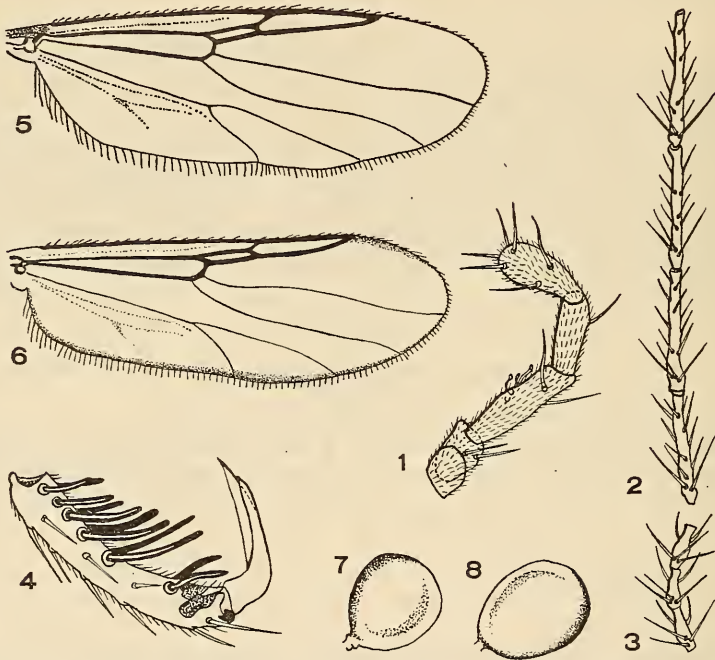
<i>Antennal segment</i>	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
<i>Length</i>	0.121	0.064	0.064	0.068	0.072	0.072	0.072	0.076	0.186	0.193	0.197	0.228	?

Thorax entirely dark blackish-brown, with a strong, sharp anterior tubercle. All coxae, trochanters, femora and tibiae dark brown, the fore tibia slightly paler, tarsi yellowish, segments I–II with apices brown, III–V light brown except base of III yellow and V of mid and hind legs yellowish ventrally, fore femur with 22–26 ventral black spines, mid femur with 1–2 preapical ventral spines, mid tibia with 1 apical spine, hind femur club-shaped distally, with 2 preapical ventral spines. Hind tibial comb of 7–10 pale spines. Fore and mid fifth tarsal segment with five ventral pairs of

batonnets, hind tarsus V with 5-6 pairs, in all cases the batonnets restricted to the basal half of the segment except for the distal pair, which are preapical, the pairs on the basal half becoming progressively longer distally, the apical pair shorter (Fig. 4).

Leg segment :	Femur	Tibia	Tarsus					Tarsal Ratio
			I	II	III	IV	V	
Length : Fore	1.035	0.795	0.285	0.178	0.098	0.079	0.197	1.59
Mid	1.200	0.915	0.471	0.201	0.102	0.091	0.186	2.34
Hind	1.380	1.080	0.653	0.292	0.110	0.083	0.216	2.23

Tarsal spines: mid I with 2 apical, II with 1-2 paler apical; hind I-II with 1 fine apical. All claws paired, equal, just over $\frac{1}{2}$ the length of the fifth tarsal segment, each with a large internal basal tooth.



Figs 1-5, 7. *Mackerrasomyia brevibarba* (Kieffer). 1, ♀ maxillary palp, $\times 165$; 2, ♀ antennal segments XI-XIV, $\times 80$; 3, ♀ antennal segments VIII-X, $\times 80$; 4, ♀ hind fifth tarsal segment and claws, $\times 165$; 5, ♀ wing, $\times 25$; 7, ♀ spermatheca, $\times 165$.

Figs 6, 8. *Mackerrasomyia marginata* n. sp. 6, ♀ wing, $\times 25$; 8, ♀ spermatheca, $\times 165$.

Haltere brown, knob black. Wing with conspicuous microtrichia, macrotrichia absent. Costal and radial veins dark brown, rest light brown. Dark bristles on costa. Costal ratio 0.76. Lengths of first and second radial cells 0.307 and 0.525 mm. respectively (Fig. 5).

Abdomen brown, spiculate, with a large pale area anteriorly, pleural membranes blackish-brown. Cerci pale brown. Spermatheca single, oval, 0.083×0.068 mm., with a short chitinised neck (Fig. 7).

Male: Unknown.

Distribution: Known only from type locality.

MACKERRASOMYIA MARGINATA, n. sp.

This species can be readily distinguished from *brevibarba* by the yellow fore tibia and partially yellow mid and hind tibiae.

Type: Holotype ♀, in SPHTM.

Type Locality: Ingham, Queensland (7.iv.1961, light trap, K. L. Harley).

Female: Length 3.30 mm., wing 2.28 × 0.78 mm.

Head dark brown. Proboscis $\frac{2}{3}$ the height of the head. Eyes bare, separated, but not as widely as in preceding species. Mandibular teeth 7. Palp light brown, segment III with several sensillae on distal surface. Palpal ratio 2.7.

Palpal segment ..	I	II	III	IV	V
Length	0.041	0.057	0.083	0.053	0.083

Antennal segment II dark brown, IV–X yellowish on basal half, brown on apical half, XI–XV dark brown, slightly paler basally, XV with a long apical bristle.

Antennal segment	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
Length	?	0.064	0.068	0.068	0.072	0.068	0.072	0.079	0.186	0.182	0.190	0.224	0.239

Thorax and legs as in *brevibarba*, except: fore tibia yellow, slightly brownish basally and apically, mid and hind tibiae with basal half dark brown, apical half yellow, hind tibia with apex brown; tarsi more whitish than yellowish; hind femur with a preapical ventral spine, fore and mid fifth tarsal segments with 4–5 pairs of batonnets, hind with 5 pairs. Hind tibial comb of 6 spines.

Leg segment:	Femur	Tibia	Tarsus					Tarsal Ratio	
Length:	Fore	0.930	0.735	I	II	III	IV	V	1.78
	Mid	1.050	0.780	0.304	0.171	0.079	0.068	0.190	2.89
	Hind	1.155	0.975	0.494	0.171	0.083	0.072	0.159	2.24
				0.646	0.288	0.114	0.083	0.182	

Tarsal spines: mid I with 1 ventral, 2 apical, II with 1 apical; hind I with 1 apical, II with 1 fine and 1 stronger apical. Claws as in *brevibarba*.

Haltere with stem dark brown, knob black. Wing as in *brevibarba*, but the wing margin shaded blackish (Fig. 6). Costal ratio 0.76. Lengths of first and second radial cells 0.255 and 0.517 mm. respectively.

Abdomen dark brown, without conspicuous anterior pale area. Cerci light brown. Spermatheca single, oval, 0.091 × 0.076 mm., with a short chitinised neck (Fig. 8).

Male: Unknown.

Acknowledgements

The assistance given in the preparation of this paper by Associate Professor D. J. Lee, of the School of Public Health and Tropical Medicine, is gratefully acknowledged, as are the comments provided by Dr. W. W. Wirth, Systematic Entomology Laboratory, U.S. Department of Agriculture, on the relationships of the Australian species formerly classed as *Heteromyia*.

References

- DUBET, J. P. and LANE, J., 1955.—Novas *Heteromyia* da Argentina (Diptera, Ceratopogonidae). *Dusenía*, 6 (1/2): 35-40.
- JOHANNSEN, O. A., 1943.—A Generic Synopsis of the Ceratopogonidae (Heleidae) of the Americas, a Bibliography, and a List of North American Species. *Ann. Ent. Soc. Amer.*, 36: 763-791.
- KIEFFER, J. J., 1906.—Chironomidae. Wytzman's Genera Insectorum, fasc. 42: 44-78.
- , 1917a.—Chironomides d'Australie. *Ann. Mus. Nat. Hung.*, 15: 177-199.
- , 1917b.—Chironomides d'Amerique. *Ann. Mus. Nat. Hung.*, 15: 292-364.
- LEE, D. J., 1948.—Australasian Ceratopogonidae (Diptera, Nematocera). Part V. The *Palpomyia* Group of Genera. *Proc. Linn. Soc. N.S.W.*, 73 (1-2): 57-70.
- MACFIE, J. W. S., 1940.—The Genera of Ceratopogonidae. *Ann. Trop. Med. and Parasit.*, 34: 13-30.
- SAY, T., 1825.—*American Entomology*, 2: 79.
- TOKUNAGA, M., 1966.—Biting Midges of the Palpomyiinae from New Guinea (Diptera: Ceratopogonidae). *Pac. Insects*, 8 (1): 101-152.
- WILLISTON, S. W., 1900.—In Godman, F. D., and Salvin, O., eds., *Biologia Centrali-Americana*, 43 (Diptera, Vol. I, Supplement, pp. 217-332).
- WIRTH, W. W., 1952.—The Heleidae of California. *Univ. Calif. Publ. Ent.*, 9: 95-266.